1: J Neural Transm Suppl. 1999;57:161-77. Related Articles, Links

Expression of the dihydropyrimidinase related protein 2 (DRP-2) in Down syndrome and Alzheimer's disease brain is downregulated at the mRNA and dysregulated at the protein level.

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Deteriorated migration, axonal pathfinding and wiring of the brain is a main neuropathological feature of Down Syndrome (DS). Information on the underlying mechanisms is still limited, although basic functions of a series of growth factors, cell adhesion molecules, guidance factors and chemoattractants for brain histogenesis have been reported. We used proteomics to detect differences in protein expression between control, DS and Alzheimer's disease brains: In five individual brain regions of 9 individuals of each group we performed two dimensional electrophoresis with MALDI--identification of proteins and determined mRNA levels of DRP-2. Significantly decreased mRNA levels of DRP-2 in four brain regions of patients with DS but not with AD as compared to controls were detected. 2D electrophoresis revealed variable expression of DRP-2 proteins, which showed a high heterogeneity per se. Dysregulation of DRP-2 was found in brains of patients with DS and AD presenting with an inconsistent pattern, which in turn may reflect the inconsistent neuropathological findings in patients with DS and AD. The decrease of mRNA DRP-2 steady state levels in DS along with deteriorated protein expression of this repulsive guidance molecule of the semaphorin/collapsin family, may help to explain deranged migration and histogenesis of DS brain and wiring of AD brain.

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